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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/000,177	11/02/2001	Shinichi Terashima	52433/663	9514

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EXAMINER	
GRAYBILL, DAVID E	
ART UNIT	**PAPER NUMBER**
2822	

DATE MAILED: 02/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/000,177	TERASHIMA ET AL.	
	Examiner	Art Unit	
	David E. Graybill	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,10,17,22,23 and 46-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,10,17,22,23 and 46-62* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 10, 17, 22, 23, 46, 47, 51, 52 and 57-62 are rejected under 35 U.S.C. 102(b) as being anticipated by Zechman (5824568).

At column 2, line 1 to column 4, line 14, Zechman discloses the following:

A semiconductor device 1, using a bonding material 4 for linking a semiconductor terminal 3 to a connecting terminal 5 for an outside circuit, characterized by inherently reinforcing the bonding material and/or a joint between the semiconductor terminal and a the connecting terminal with an inherently reinforcing material 10; the bonding material is a bonding wire and/or a bump; the bonding material consists of any one of gold, tin, copper, aluminum and an alloy of any of these metals; the bonding material and the reinforcing material consist of different materials; the reinforcing material is a metal coating and/or an inorganic material coating covering the bonding material or joint; forming the connecting terminal using a substrate, a lead frame or a TAB tape; forming the semiconductor terminal on any one of a semiconductor chip 1, a substrate, a lead frame or a TAB tape; the

semiconductor terminal has a surface made of copper, aluminum, nickel, cobalt, gold, silver or an alloy of any of these metals.

A semiconductor device, using a bonding wire for linking a semiconductor terminal to a connecting terminal for an outside circuit, characterized by reinforcing the bonding wire, either partially or wholly, with a reinforcing material after bonding work; the bonding material and the reinforcing material consist of different materials; the reinforcing material is a metal coating and/or an inorganic material coating covering the bonding wire; the bonding wire is fabricated from any one of gold, copper, aluminum, silver and an alloy of any of these metals; the bonding wire is gold; forming the connecting terminal using a substrate, a lead frame or a TAB tape; forming the semiconductor terminal on any one of a semiconductor chip, a substrate, a lead frame or a TAB tape; the semiconductor terminal has a surface made of copper, aluminum, nickel, cobalt, gold, silver or an alloy or any of these metals.

A semiconductor device, using a bonding wire 4 for linking a semiconductor terminal to a connecting terminal for an outside circuit, characterized by: the bonding wire having a diameter of less than 20 μm; and reinforcing the bonding wire, either partially or wholly, with a reinforcing material after bonding work.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 48-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zechman as applied to claims 46 and 47, and further in combination with Ahn (6441479).

As cited, Zechman discloses forming a diffusion layer at an interface between the metal coating and the bonding wire because Zechman discloses diffusing the layer 6 by vapor deposition. In any case, the term "diffusion" is a statement of intended use of the layer, and this statement of intended

use of the layer does not appear to result in a structural difference between the claimed layer and the layer of Zechman. Further, because the layer of Zechman appears to have the same structure as the claimed layer, it appears to be inherently capable of being used for the intended use of diffusion, and the statement of intended use does not patentably distinguish the claimed layer from the layer of Zechman. The manner in which a product operates is not germane to the issue of patentability of the product; Ex parte Wikdahl 10 USPQ 2d 1546, 1548 (BPAI 1989); Ex parte McCullough 7 USPQ 2d 1889, 1891 (BPAI 1988); In re Finsterwalder 168 USPQ 530 (CCPA 1971); In re Casey 152 USPQ 235, 238 (CCPA 1967). Also, "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim."; Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). And, "Inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims."; In re Young, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 136 USPQ 458, 459 (CCPA 1963)). And, claims directed to product must be distinguished from the prior art in terms of structure rather than function. In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does [or is intended to do]." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990). Furthermore, although Zechman does

not appear to disclose verbatim the process limitation "forming a diffusion layer," the product of Zechman inherently possesses any structural characteristics imparted by the process limitation. See In re Fitzgerald, Sanders, and Bagheri, 205 USPQ 594 (CCPA 1980). Further, because the transitional claim language "characterized by" is inclusive of additional steps other than the particular recited forming step, the scope of the claims encompasses a step of removing the diffusion layer resulting in a final claimed product having no diffusion layer.

Also, Zechman does not appear to explicitly disclose that the metal coating is a metal comprising one or more of nickel, copper, gold, tin, solder, silver, cobalt, chromium, platinum, palladium and tungsten.

Notwithstanding, as cited, Zechman discloses that the metal layer is aluminum. Furthermore, at column 4, lines 55-59, Ahn discloses that aluminum and copper are alternatives and equivalents; therefore, it would have been obvious to substitute or combine the copper of Ahn for or with the aluminum of Zechman. See In re May (CCPA) 136 USPQ 208 (It is our opinion that the substitution of Wille's type seal for the cement of Hallauer in Figure 1 would be obvious to persons of ordinary skill in the art from the disclosures of these references, merely involving an obvious selection between known alternatives in the art and the application of routine technical skills.); In re Cornish (CCPA) 125 USPQ 413; In re Soucy (CCPA)

153 USPQ 816; Sabel et al. v. The Wickes Corporation et al. (DC SC) 175 USPQ 3; Ex parte Seiko Koko Kabushiki Kaisha Co. (BdPatApp&Int) 225 USPQ 1260; and Ex parte Rachlin (BdPatApp&Int) 151 USPQ 56. See also Smith v. Hayashi, 209 USPQ 754 (Bd. of Pat. Inter. 1980) (However, there was evidence that both phthalocyanine and selenium were known photoconductors in the art of electrophotography. "This, in our view, presents strong evidence of obviousness in substituting one for the other in an electrophotographic environment as a photoconductor." 209 USPQ at 759.). An express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). "It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) (citations omitted). See also In re Crockett, 279 F.2d 274, 126 USPQ 186 (CCPA 1960); Ex parte Quadranti, 25 USPQ2d 1071 (Bd. Pat. App. & Inter. 1992).

Claims 53-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zechman as applied to claims 1 and 3, and further in combination with Solc (5232970).

Zechman does not appear to explicitly disclose coating the semiconductor terminal, the connecting terminal and the bonding material and/or joint with resin; the resin is a semiconductor sealing resin containing ceramic filler.

Still, as cited, Zechman discloses coating the semiconductor terminal, the connecting terminal and the bonding material and/or joint with a dielectric encapsulating composition 8. In addition, at column 2, line 31 to column 3, line 51, Solc discloses a dielectric encapsulating composition that is a microelectronic integrated circuit sealing resin containing ceramic filler. Moreover, it would have been obvious to combine this disclosure of Solc with the disclosure of Zechman because it would facilitate provision of the composition of Zechman.

Applicant's amendment and remarks filed 12-6-4 have been fully considered, are addressed by the rejections supra, and are further addressed infra.

Applicant alleges that, "U.S. Patent No. 5,824,568 does not disclose or suggest the effect of prevention of chemical reaction between the additives, such as Br etc. contained in the resin and the metallic substrate during

sealing with sealing resin by means of coating the joints with plating material. As a result, the present invention can increase the strength, Young's modulus and fatigue strength."

This allegation is respectfully deemed unpersuasive because the claims are not limited to the effect of prevention of chemical reaction between the additives, such as Br etc. contained in the resin and the metallic substrate during sealing with sealing resin by means of coating the joints with plating material, and the prior art is not necessarily applied to the rejection for this disclosure.

The art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.

For information on the status of this application applicant should check PAIR: Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alternatively, applicant may contact the File Information Unit at (703) 308-2733. Telephone status inquiries should not be directed to the examiner. See MPEP 1730VIC, MPEP 203.08 and MPEP 102.

Any other telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (571) 272-1930. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.
The fax phone number for group 2800 is (703) 872-9306.

David E. Graybill
Primary Examiner
Art Unit 2827

D.G.
17-Feb-05